MACKENZIE. (J. N.)

Larynx — trachea, and bronchi, Syphilis of the. Historical sketch.

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LARYNX, TRACHEA, AND BRONCHI, SYPHILIS OF THE. Historical Sketch.—It is not the purpose of the present article to discuss the antiquity of the venereal complaint, but simply to briefly review the evidence of its ancient origin as far as it relates to affections of the nose and throat. As some of the weightiest arguments in favor of the remote existence of syphilis rest upon the supposed early recognition of specific disease of the upper respiratory apparatus, it may be interesting to examine the reasons alleged for this assumption, which has been defended with so much talent and erudition.

It has been maintained by some that certain passages in the ancient records of Chinese and Hindu medicine render it probable that syphilitic affections of the nose and throat have been recognized from the earliest times.[1]

The evidence deducible from the researches of Dabry is, however, as Verneuil[2] has pointed out, inconclusive in view of their many chronological inaccuracies, while there is no sufficient reason for the belief that the disease described in the Ayur Véda is the affection which we now recognize as syphilis.

Both Hippocrates[3] and Galen[4] allude to falling in and depression of the nose from recession of the palate bones, and they and their followers refer to destructive ulceration of the larynx, trachea, and nose. Aretæus,[5] in his famous and much-discussed description of the disease called *uva*, asserts that the palate bone is sometimes laid bare, and that the ulcerative process spreads over to the fauces and even the epiglottis; but these isolated observations furnish obviously slender data upon which to base the antiquity of the venereal complaint.

The attention paid to, and the frequency with which the disease called by the Greeks *ozæna* is encountered in the writings of the ancients, are at first sight naturally suggestive of their acquaintance with syphilitic affections of the nasal passages; but, if we reflect upon the sense in which this term was employed by the large majority of physicians and grammarians of those times, we shall be obliged to confess that it forms an uncertain element in the chain of evidence which links the nasal syphilis of to-day with the ozæna of the Greek physicians.

By many of the ancient medical writers ozæna and polypus are used as convertible terms, and the cure of the two affections is considered under the same head.

In this sense, too (*i.e.*, as synonymous with polypus), the term is used by Pliny; and even among the later Latin grammarians the appellation *ozænosus* was applied to those who suffered from nasal polypi. It is exceedingly probable, then, that the term ozæna did not carry with it the same significance which attaches to its use at the present day. The ancients have left but scanty record of the measures they adopted in cleansing the nasal passages, and indeed, if we consider their notions concerning the pathology of nasal discharges, it would not be surprising if they neglected that important process altogether. A form of instrument, the rhinenchytes, for injecting the nasal cavities, is mentioned by Aurelian[6] and Scribonius Largus,[7] but it is highly probable that the important hygienic measure of systematic cleansing and disinfection was neglected, and that the secretion was allowed to accumulate and decompose within the nostrils—a condition which we know favors the development of a peculiar odor even in simple catarrhal inflammation of these cavities. It is, moreover, very probable that the hypertrophic, and consequently the atrophic, form of rhinitis were common affections among the citizens of ancient Greece and Rome. Finally, as the term ozæna, especially when used in the sense of a stench from the nostrils, serves to express a number of different pathological states, and in the light of our present knowledge concerning atrophic rhinitis, it is illogical to maintain that the ancients were acquainted with the nasal form of syphilis because of the frequent allusion to ozæna in their medical writings.

The foul mouth, hoarse voice, and snoring respiration of the cunnilingus, fellator and irrumator[8] have been thought to indicate syphilitic affections of the throat, but, as I have suggested elsewhere, they were doubtless the symptoms of a catarrhal process acquired in the discharge of their filthy occupations.

Reiskes thus describes the cinædus or sodomite: "In naribus et in palato vitium, a qua clare non potuerint eloqui, sed, ῥεγχειν, stertere et rhoncissare debuerint."[9] The value of this passage in evidence, it seems to me, turns upon the rendering of the word *vitium* (and not, as Rosenbaum[10] and others maintain, upon the verb ῥεγχειν), which may mean anything from a simple inflammatory condition to destruction by ulceration; and it may be with equal justice contended that the affection described by Reiskes may be referred to the advanced forms of hypertrophic naso-pharyngeal catarrh. At all events, there is no possible reason why we should lay the affection of the sodomite at the doors of syphilis.

Equally uncertain is the evidence adduced by the same writer[11] from the disease of the armpits among the Lesbians, which destroyed their noses and voices, and was supposed by Dio Crysostom, who drew attention to it, to have been the angry visitation of the goddess Aphrodite.

If now we turn to the passages which have been taken from the satirical writers of antiquity, the same uncertainty is found. The following are the only ones, it seems to me, worthy of the slightest consideration. The first is taken from Martial; a certain Festus, after he found that a dire disease had invaded his fauces, and crept into his countenance, committed suicide.

> "Indignas premeret cum tabida fauces
> Inque ipsos vultus saperet atra lues."[12]

The second is also from Martial, and refers to the debauchee and sodomite:

> "Qui recitat lana fauces et colla revinctus
> Hic se posse loqui, posse tacere negat."[13]

Now, it is perfectly obvious that the disease from which Festus was supposed to suffer may have been a cancerous or other malignant affection; and in the case of the debauchee it is manifestly absurd to infer the existence of syphilis from what was most probably a simple sore throat.

In the fifteenth century there lived an obscure poet, by name Pacificus Maximus, who, in spite of his apparently dissolute tendencies, as reflected in a volume of wanton poems published by him in 1489, managed to eke out a lascivious existence of exactly one hundred years.* Among his poems is the following invocation of Priapus, which possesses a certain historical value:

> "Tuque meum si non properas sanare Priapum,
> Decidet heu! non hoc nobile robur erit.
> Ante meis oculis orbatus priver, et ante
> Abscissus fœdo nasus ab ore cadat!
> Non me respiciet, nec me vollet ulla puella,
> In me etiam mittet tristia spata puer,
> Lætior heu! toto me non erat alter in orbe!
> Si cadet hic, non me tristior alter erit.
> Me miserum! Sordes quas marcidus ore remittet!
> Ulcera quæ fœdo marcidus ore gerit!
> Aspice me miserum, precor, O! per poma, per hortos,
> Per caput hoc sacrum, per rigidamque trabem,
> Hinc ego commendo tota tibi menta, Priape,
> Fac valeat, sic sit sanus ut ante fuit."†

In connection with the early origin of the venereal complaint I would like to call attention to the following passages, which I discovered accidentally while engaged in an historical research foreign to the subject now

* Born 1400, died 1500.
† Attention was first called to this poem by Sanchez, in the Journal de Vandermonde for October, 1759, tom. ix.

under review. The sonnet is one by Sulpicius Lupercus Servastus, Junior,* and runs as follows:

"Atqui sunt, quod propter honestum rumpere fœdus,
Audeat inlicite pallida avaritia.
Romani sermonis egens, ridendaque verba
Frangit ad horrificos turbida lingua sonos.
Sed tamen ex vultu adpetitur spes grata nepotum.
Saltem istud nostri forsan honoris habent.
Ambusti torris species, exesaque seclo
Abduntur priscis corpora de tumulis
Perplexi crines, frons improba, tempora pressa,
Extantes mala deficiente genæ
Simatque jacent pando sinuamine nares.
Territat os nudum, cæsaque labra trement.
Defossum in ventrem propulso pondere tergum
Frangitur, et vacuo crure tument genua.
Discolor in manibus species, ac turpius illud,
Quod cutis obscure pallet in invidiam." [14]

Leaving now the question of the ancient recognition of the throat and nasal lesions of syphilis, and coming down to the close of the fifteenth century, when the affection is generally supposed to have been discovered, we find that the earlier writers on the lues venerea looked upon "softening" of the uvula, ulceration of the pharynx, tonsils, and fauces, perforation of the palate, catarrhal and destructive disease of the nasal passages, and a hoarse and raucous character of the voice as diagnostic signs of the disease.[15] Among them Frascatorius,[16] in his celebrated poem on syphilis, speaks of affections of the voice and obstruction in the pharynx, and Alexander Trajanus Petronius[17] (1566) refers to liquids taken by the mouth returning thereby, and to chronic hoarseness (*vox rauca perseverans*) as symptoms of syphilitic infection. Both Maynardi[18] and Fallopius mention difficult breathing from disease of the larynx and trachea, and tinnitus and other symptoms referable to disease of the ear were observed, among others, by Botallus, Tomitanus, and Petronius.

While these writers were doubtless thoroughly conversant with the ravages produced by syphilis in the nose and pharynx, and with affections of the voice and respiration, nothing definite was known concerning the pathological changes in the larynx until about the middle of the seventeenth century, when Marcus Aurelius Severinus[19] found in the body of a girl, dead of syphilis, the epiglottis completely destroyed by ulceration. This writer[20] seems also to have been familiar with ulceration of the trachea, bronchi, and œsophagus.† In 1678 Gunther Christopher Schelhammer[21] adverted to dryness of the larynx from ulceration of the uvula, and in the early part of the following century Vercollonius[22] gave a systematic account of syphilitic affections of the tonsils, pharynx, larynx, trachea, and œsophagus. Later on the subject of throat syphilis, from a clinical standpoint, was treated of in detail by Boerhaave,[23] Astruc,[24] Plenck,[25] Benjamin Bell,[26] John Hunter,[27] and Swediaur,[28] while Morgagni[29] directed attention to the anatomical appearances of the affection. Among the writers of the eighteenth century Raulin[30] seems to have been acquainted with syphilitic ulceration as it affects the larynx, trachea, and œsophagus.‡

At the beginning of the present century Thomann[31] drew attention to syphilis of the windpipe, and Altenhofer[32] announced, in a very valuable paper based on extensive experience, that tracheal phthisis is often the result of malignant or neglected syphilitic throat ulceration.

The impulse given to the pursuit of pathological anatomy by the colossal labors of Morgagni led, among other things, to the study of ulceration of the upper air-passages and to the publication of a number of special treatises on the subject,[33] which culminated in the classical mémoire of Trousseau and Belloc.[34] These observers, as well as those who preceded them, included syphilis, tuberculosis, and other chronic laryngeal affections under the generic term "phthisis laryngea," and this confusion practically reigned until the introduction of the laryngoscope, and the pathway to differential diagnosis was opened by the laryngoscopic studies of Tuerck.[35]

Syphilis of the Larynx.—Statistics differ widely as to the frequency with which syphilis attacks the larynx. While the elementary character of the present work precludes a critical examination of the sources of error discoverable in the antagonistic reports of different observers, it may be said, in general, that reconciliation of diverging opinions upon this subject can only be accomplished by taking the life-histories of the cases upon which the statistical evidence is based. Were this method universally adopted, we believe that few syphilitics would be found who had not, at some period or other of the disease, suffered from some form of laryngeal affection.

The delicate structure of the larynx, the irritation to which it is exposed in the natural discharge of function, or in the unnatural exercise of the same from disease of adjacent and communicating organs, as the nose and pharynx, the common invasion of its structures in other forms of acute and chronic blood-poisoning, and its frequent exposure to a host of other unfavorable influences from direct or reflected irritation, furnish, *à priori*, grounds for regarding this organ as a frequent seat of the manifestations of constitutional and hereditary syphilis. The impairment of nutrition induced in its structures by the circulation within their substance of a vitiated fluid, and the consequent vulnerability of its mucous membrane to the causes that determine catarrhal conditions, predispose, among other things, to the phases of so-called secondary inflammation, while its wealth in fibrous tissue and fibro-cartilage doubtless invites invasion by the tertiary processes of the disease.

While it is therefore probably true that the majority of cases of constitutional or hereditary syphilis, if untreated or neglected, will sooner or later develop some phase of laryngeal disorder, it is equally certain that the eruption of the disease in the larynx can be prevented or modified by early therapeutic interference. As the virulence of syphilitic lesions in general is modified by the employment of the more advanced and rational methods for its cure, so the destructive affections of the larynx are less frequently met with now than in the time when the therapeutics of the disease were less perfectly understood, and when the exhibition of mercury to salivation was the catholicon of the profession.

Certain it is, that the proportion of the more destructive forms of laryngeal syphilis is small, compared with their constancy and the terrible ravages to which they gave rise, as described by the writers of the fifteenth and sixteenth centuries. While, therefore, it is safe to affirm that the proportion of cases of laryngeal disease in syphilis has been notably diminished by the rational use of mercury, and especially by the tonic treatment of the disease, as formulated by Keyes,[36] the injudicious use of that drug, on the other hand, may be looked upon as having contributed in the past in no small degree to the determination of the disease to the throat. For when we recall the extensive ulceration of the pharynx and larynx sometimes produced by mercurials, and the free way in which the latter were often administered,[37] it is easy to conceive of the disastrous influence of their incautious administration upon structures peculiarly obnoxious to the ulcerative forms of syphilis.

The time elapsing between inoculation and invasion of the larynx varies greatly. Lewin,[38] who has given this

* Nothing is known concerning the age at which this member of the Sulpicii lived, the only trace of his literary existence being preserved in the above.

† Severinus's observations were made in the post-mortem room of a large hospital for venereal complaints, and must be regarded as the first pathological researches in the direction of syphilitic affections of the larynx.

‡ In the sixteenth century Schenck, of Grafenberg (Observat. medicæ de capite humano; hoc est exempla capitis morborum, etc., obs. cccxlix., p. 397, Basiliæ, 1584) spoke of the "gula ex ulcere Gallico exesa procidens devorata," and also of perforation and loss of the palate (ob. cccxlvii., from Paré). In 1778 Andrew Duncan (Medical Cases, etc., p. 176 *et seq.*, Edinburgh, 1778) called attention to dysphagia resulting from increased sensibility of the pharynx from pre-existing syphilitic sore throat; and Zeviani (quoted by Voigtel, Handbuch d. path. Anat., Bd. ii., Halle, 1804) placed on record a case in which a syphilitic ulcer of the windpipe communicated with the œsophagus. I would also call attention to the fact that Dolæus (Encyclopædia chirurgica rationalis, etc., ii., cap. v., p. 276, Francofurt. ad Mœnum, 1703), in his chapter on strictures of the œsophagus, observes, "aliquando angustia hæc fieri solet a caruncula gulæ ex ulcere venereo aborta." These cases of œsophageal syphilis may be added to those collected from the older literature of the subject by Astruc, Van Swieten, and Lieutaud.

particular attention, asserts that the minimum period is from two and a half to three months, while in the well-known case of Türck, the laryngeal affection developed thirty years after infection.[39]

The rarity of primary inoculation of the pharynx and tonsils precludes the framing of any definite conclusions concerning the rapidity of subsequent laryngeal invasion, nor has any relationship been established between the severity of the respiratory lesions and the size of the primary sore. Reasoning by analogy, however, it might be said that an early invasion of the larynx may be looked for in primary disease of the tonsils, and that the destructive tendency may vary with the character of the initial lesion.

The laryngeal lesions of syphilis are superficial and deep. Superficial changes usually appear early during the secondary stage of the disease, while the deeper, destructive lesions occur later, in the period of tertiary phenomena. The laryngeal inflammation is therefore, as a rule, associated with the corresponding external phenomena of these periods.* This relationship between the laryngeal and cutaneous lesions is, however, by no means invariable, especially as regards the superficial lesions, and even deep ulceration may be met with at an early period of the disease.

It sometimes happens that laryngeal inflammation and ulceration appear many years after the constitutional malady has run its course, and lesions of the pharyngo-laryngeal tract are occasionally encountered without antecedent cutaneous or visceral changes. In several cases seen by me, it was from the appearance of ulceration in the larynx that the patients and their attendant first became aware of the previous existence of the initial lesion. This remarkable tendency of syphilitic lesions to make their appearance in some portion of the upper respiratory tract long after the affection has apparently run its course, or without antecedent cutaneous and visceral phenomena, is especially worthy of note, and also the fact of their isolation, under these circumstances, in the nose, pharynx, larynx, or trachea, without disease of adjacent or communicating organs. Syphilis of the larynx is generally consecutive to inflammatory changes in the pharynx or nasal passages, but occasionally occurs as an independent affection. In rare instances it is the result of extension from the trachea. The age at which the disease appears will depend, of course, upon the time of infection, and, as men are more exposed to the exciting causes of inflammatory affections of the larynx, it is more frequently met with in the male sex.

The experience of the writer as regards the relative frequency of secondary and tertiary lesions is in favor of the more common occurrence of the former, if the simple catarrhal affections of that period be included under the head of true syphilitic phenomena.

Varieties.—The lesions of laryngeal syphilis are pathologically separable into two main groups, corresponding to the secondary and tertiary periods of the constitutional affection. In addition to these, there is a class of case which cannot be assigned to either extreme, and which belong to what Whistler[40] has aptly termed the "intermediate" period.

I. *Lesions of the Secondary Period.*—In this stage the mucous membrane and submucous tissues are the structures involved, and the appearances consist either in transient or permanent hyperæmia, or in well-defined catarrhal inflammation. The former presents nothing characteristic, the latter is differentiated from simple inflammation by the less pronounced character of the hyperæmia, and by the tendency to multiple superficial ulceration. There is, however, nothing absolutely characteristic in the anatomical appearances of this form of syphilis. The mucous membrane is, as a rule, paler than normal, sometimes even almost white, and the presence of minute ulcers, especially in number, and associated with similar appearances in the pharynx, is of value in the anatomical diagnosis of syphilis.

In the laryngoscopic image the existence of a brownish-red, mottled appearance of the vocal cords, especially if the condition be symmetrical, together with erosions or superficial ulceration of the edges of the vocal cords, on the free border and posterior surface of the epiglottis or ventricular bands, should lead to a suspicion of the specific nature of the inflammation.

While these appearances are strong presumptive evidence in favor of the existence of syphilis, it were more prudent to look for other phenomena and historical data before giving a decided opinion. The ulcers of this period are either follicular in origin or result from the breaking down of the more superficial portions of the mucous membrane. These minute losses of substance often coalesce to form a large ulcer with well-defined, elevated walls, and grayish-mottled base, which, in healing, leaves a small, somewhat depressed cicatrix. This latter from a clinical standpoint offers weighty evidence in favor of syphilis.

Whether ulceration of the laryngeal mucous membrane ever results from inoculation by the pharyngeal secretion cannot be affirmed with any degree of positiveness.

Mucous patches and condylomata. The utmost confusion prevails concerning the occurrence and frequency of mucous patches in the larynx. While their existence in this organ is strenuously denied by some who have specially investigated the subject, the very opposite opinion is entertained by equally competent observers. In a large number of patients with laryngeal syphilis that have come under the observation of the writer, he recalls but one case concerning the nature of which there could be little doubt.* The failure to detect the presence of mucous patches in the larynx may be due, as Morell Mackenzie[41] observes, to their fleeting character; while, on the other hand, it is highly probable that many of the so-called mucous patches described by writers are in reality nothing more than papillomatous excrescences or small ulcerating gummata.

The laryngeal mucous patch, so-called, appears in the mirror as a grayish-red or whitish-yellow elevation, rounded or oval in contour, and surrounded by an inflammatory areola. This may disappear completely or disintegration and ulceration may ensue. Small papillary hyperplasiæ not infrequently occur in the neighborhood of existing ulcerations or on the confines of an old cicatrix, which should, however, not be confounded, as has been done, with the true condylomata.

II. *Lesions of the Intermediate Period.*—These have been well described by Whistler. The anatomical peculiarity of this stage resides in a chronic diffuse laryngitis, characterized by its constant tendency to relapse, and by the existence of ragged ulceration of the vocal cords. These ulcers, in fact, represent, so to speak, a transition stage from the superficial destruction of the secondary to the deeper and more malignant ulceration of the tertiary period.

The ulceration of both the secondary and intermediate periods occasionally extends to the fibro-cartilaginous structures, but the latter complication is much more frequently due to ulceration of tertiary development.

III. *Lesions of the Tertiary Period.*—In this stage all the structures of the larynx may be involved, singly or in combination. The proclivity of syphilis to attack those cartilages only that are invested with perichondrium applies with especial force to the cartilaginous structures of this organ. The characteristic lesions of this period are gummata, deep ulceration, and fibroid degeneration.

1. *Gummata* appear as solitary or multiple tumors of varying size and shape, and of smooth, regular contour, which may proceed from any of the laryngeal structures,

* M. Dance has attempted to show that roseola, and even the tubercular and papular syphilide occur in the larynx simultaneously with their eruption upon the external surface (Eruptions du larynx survenantes dans la periode secondaire de la syphilis, Paris, 1864). These observations have never been confirmed.

* The subject was a woman suffering from secondary syphilis. On the left vocal cord, about its centre, was a small, oval, yellowish-white patch, smooth in contour, and slightly elevated above the surface of the cord. Its long diameter was parallel with the free border of the cord, and its base surrounded by a scarlet inflammatory areola. The laryngeal membrane was slightly erythematous. Three days afterward both patch and areola had disappeared.

but which are usually found in the submucous tissue of the free border and posterior surface of the epiglottis and the interarytenoid space. They are occasionally met with in the subglottic region, on the ventricular bands and vocal cords. They vary in size from that of a mustard-seed to a tumor that calls for tracheotomy.

The color of the mucous membrane covering the gumma is at first intensely red, and occasionally small vessels are developed in its vicinity. Gradually, under the increased pressure of the submucous deposit, it becomes pale, thin, and transparent, so that the peculiar yellow or whitish-yellow color of the gummatous infiltration is distinctly visible. Necrosis of the anæmic membrane soon follows, and an ulcer results which rapidly invades the submucous tissues, forming a more or less crater-like excavation, not infrequently involving the perichondrium and underlying cartilage. In small gummata absorption of the infiltration may be secured by the exhibition of antisyphilitic remedies, even after considerable thinning of the mucous membrane has taken place.

In histological structure the laryngeal gumma does not differ from similar products in other parts of the body.

An isolated case is on record where giant cells were found in the gummatous infiltration of the larynx,[42] but this is probably an exceptional and accidental occurrence.

Well-defined gummatous tumors of the larynx are comparatively rarely met with as compared with diffuse syphilitic infiltration.

2. *Fibroid Degeneration.*—In the later stages of tertiary syphilis there is in a certain proportion of cases a decided tendency to the gradual development of fibroid tissue in the structures of the larynx, which tends to diminish the lumen of the organ, not only by contraction of the new-formed tissue, but also by the production of large, dense fibroid tumors, which are often mistaken for and described as gummy tumors, but which pathologically have nothing in common with them. These fibroid utmors appear as hard, nodular masses occupying the epiglottis, ary-epiglottic folds, and other portions of the vestibule and subglottic region. Sometimes the greater portion of the organ is converted into a dense hypertrophic mass. Acute ulceration occurs, and is fraught with great danger from accompanying œdema, and each succeeding attack of ulceration favors a greater deposit of fibrous tissue and increases proportionately the gravity of the case. In this variety of laryngeal syphilis, which Whistler has especially insisted upon, no retrograde metamorphosis takes place; its processes are essentially progressive, and the calibre of the larynx becomes diminished sooner or later by an irregular nodular mass—half hypertrophied tissue, half cicatricial bands—which does not subside under internal or local treatment, and which, if extensive, demands tracheotomy.

These fibroid tumors may be differentiated from gummata by their pale grayish or whitish appearance, by the surrounding anæmia of the mucous membrane, and by the absence of the peculiar yellowish submucous discoloration of the latter. The hard, dense sensation communicated to the probe contrasts, too, forcibly with the soft elastic feel of the gummy growth.

This class of cases is only seen in hospital or dispensary practice, and presents a long history of neglected laryngeal trouble with gradually increasing obstruction to respiration. These tumors are more common than is generally supposed, and probably constitute a large proportion of the specimens which are labelled "gummata" in anatomical museums and collections.

Sections of the growths show under the microscope thickening of the mucous membrane, a round-cell infiltration of the submucous tissues, and abundant meshes and wavy bands of fibrous tissue, which in contracting obliterate more or less completely the vessels and glandular elements of the parts. Whether this fibrous tissue starts from the perichondrium or submucous layer, or both, or what relation it bears to the fibroid hyperplasiæ which are found after the cicatrization of ulcers, has not as yet been made out, but it is not improbable that this hypertrophic syphilitic laryngitis may be due to the combined action of these different factors.

3. *Tertiary Ulceration.*—Ulcers of the tertiary period result from atrophy of the mucous membrane, through the pressure of the underlying infiltration and the consequent purulent degeneration of the latter, and in this way excavations are formed, of more or less circular outline, with a deep base of grayish or lardaceous appearance and with elevated, clearly defined, and often bloodshot walls, surrounded by a scarlet zone of inflammation, and covered with a foul, dirty yellowish secretion, which imparts to the breath a peculiar and somewhat characteristic odor.

Of varying sizes, the tertiary ulcer may be multiple, and occur in any portion of the larynx and subglottic space; but it is generally solitary and occupies by preference the lingual surface and free edge of the epiglottis. It may be said, in general, that ulceration of the upper part of the larynx is much more common than ulceration of the cords and subcordal region. The ulcerative process not infrequently extends along the ary-epiglottic fold to the ventricular band, or from the latter to the ventricles. The epiglottis may present a crenated appearance, like the comb of a cock, or a punched-out aspect; or it may be depressed in various other ways. Occasionally it is perforated. It may be reduced to a mere rudiment, or finally be completely destroyed.

Syphilitic ulceration of the larynx heals by peripheral cicatrization, as has been well described by Virchow. Around the borders of the ulcer dense, callous connective tissue makes its appearance, which is characterized by excessive peripheral growth, as in the cicatrix following a burn. The resulting scar varies in appearance, according to the size and situation of the original ulcer. On the ventricular bands and free surface of the epiglottis, it is generally star-shaped, while in other situations firm, fibrous bands are formed which connect them with, or bind them down upon, adjacent structures.

As the ulcers heal, there spring up at the periphery of the cicatrices small papillary or fibroid hyperplasiæ, and thus, later on, small areas are found decked with growths, which mark the site of past ulceration.

The deformities which result from the cicatrization of large ulcers are quite characteristic. The epiglottis may be bound down to the base of the tongue, to the lateral and even posterior pharyngeal wall, adhesions may form between its free edges and the ary-epiglottic fold, between the latter and the ventricular bands and pyriform sinuses, and between the free edges of the ventricular bands; or the whole interior of the larynx may be converted into a contracted cicatricial channel in which all trace of the original anatomy of the parts is lost. Occasionally the larynx as a whole is displaced, or individual parts are thrown into unnatural positions by the contraction of the new-formed tissue. When ulceration occurs on surfaces that are brought in contact in the natural exercise of function, as for example, the vocal cords, membranous formations composed of cicatricial tissue are occasionally developed between the opposing ulcerative surfaces, thus forming a web between them—a condition which has been especially well described by Elsberg.[43]

If cicatrization be not promoted, the ulcers rapidly descend to the perichondrium, purulent inflammation of that structure is established and the cartilage laid bare.

Perichondritis and necrosis of the cartilages may also develop as a primary affection—possibly, though rarely, as a metastatic (septic) inflammation of the fibro-cartilaginous tissue. The cartilage thus becomes surrounded by a purulent infiltration which takes place beneath and in the meshes of the perichondrium, caries occurs and the necrotic portions are expelled as a granular detritus or as well-formed sequestra. Sometimes an entire cartilage is expelled in the effort to expectorate. While expulsion of necrotic cartilage usually takes place by the mouth, it occasionally happens that the necrosed plate falls into the trachea and causes death. The entire epiglottis has also been found in the stomach.

The presence of necrotic cartilage in the larynx, apart from other dangers to which it may give rise, aggravates the existing local disease, increases suppuration, and may

even lead, if not artificially extracted, to metastatic abscesses in various parts of the body, to pyæmia, and death.

If perichondritis do not result fatally, recovery takes place, at the expense of the functions of the larynx, with permanent anchylosis, with consequent paralytic affections and diminution in the calibre of the larynx, or fistulous tracks may be established between the cartilage and interior of the larynx, or may connect the former with the external surface.

A remote danger from tertiary laryngeal ulceration is death from hæmorrhage, as in the classical case of Türck,[44] where the laryngeal artery was opened, and in the one mentioned by Rokitansky,[45] where sudden death occurred from perforation of the aorta.

In all forms of tertiary syphilis of the larynx and in the deeper ulceration of the secondary and intermediate periods there is a tendency to acute and chronic œdema. The former occurs suddenly, and is sometimes the immediate cause of death; the latter develops slowly, and, in some instances, without danger to life, while in others it causes progressive dyspnœa, which may terminate fatally by sudden increase of the serous infiltration.

Symptoms and Complications.—It is manifest from the above that the symptoms and complications of laryngeal syphilis are of the most varying nature, and may consist in very slight modification of the vocal and respiratory functions or in their complete destruction; and even, secondarily, abrogation of the process of deglutition.

Diagnosis.—The distinctive points of difference between the diffuse laryngitis of the secondary period and simple catarrhal inflammation have been already given. The older writers laid great stress upon a peculiar raucous character of the voice as diagnostic, and the *vox rauca syphilitica* was placed among the pathognomonic symptoms of the disease. This quality of the voice is, however, met with when the vocal cords are congested, thickened, or abraded from simple inflammation, and cannot, therefore, be looked upon as characteristic of syphilitic laryngitis; though it may be of value in differentiating the latter from tubercular inflammation.

In the earlier laryngeal affections of tuberculosis the pronounced pallor of the mucous membrane of the pharynx, larynx, and nasal passages, the tendency to swelling and congestion of the posterior and inferior portions of the larynx, together with a hyperæsthetic condition of the upper air-passages, and especially the pharynx, and the slow development and persistence of the ulcers (generally on the vocal processes) will lead to an examination of the lungs, where evidences of commencing consolidation are generally to be found upon careful examination. In doubtful cases, where such evidence is wanting at the apices, the writer has repeatedly discovered signs of a localized bronchitis between the scapulæ, and the diagnosis has been verified by the subsequent development of the case.

Tertiary syphilitic ulceration of the larynx, and that which occurs in the intermediate period, may be confounded with that of tuberculosis and carcinoma.

From tuberculosis it may be differentiated by attention to the following points: Syphilitic ulcers are usually single, develop rapidly, and are preceded or accompanied by localized unilateral swelling of the mucous membrane or by gummatous growths. Tubercular ulcers, on the other hand, are generally multiple, are slow in development, and are preceded, as a rule, by a peculiar lustreless, opaque thickening of the membrane (tubercular infiltration). This may, in turn, be distinguished from the œdema which complicates syphilis, in that the latter is commonly unilateral, or confined to the parts principally affected, is glistening, more or less translucent, and does not partake of the opaque, dull color of tubercular deposit. When the latter leads to the peculiar pyriform swelling of the ary-epiglottic folds or to the turban-shaped epiglottis (*vide* article on Larynx, Phthisis of) it furnishes pathognomonic proof of tuberculosis. Syphilitic ulcers are larger, as a rule, than tubercular ulcers, and their favorite seats are the anterior surface and free edge of the epiglottis, while tubercular ulceration is most frequently encountered in the lower and posterior portions of the larynx and on the ventricular bands. When tuberculosis attacks the epiglottis it is generally the lower and posterior surface that is involved, and it may be said, in general, that the tendency of syphilitic ulceration is to develop from above downward, that of tuberculosis from below upward. Bilateral ulceration of the larynx, and especially of opposing surfaces, other things being equal, is in favor of tuberculosis.

Deformity always results when any of the laryngeal structures, as, for example, the epiglottis, is perforated from syphilitic ulceration, while the perforating ulcer of tuberculosis has little or no effect upon the natural shape and position of the cartilage. The syphilitic ulcer is deep, cleanly cut, with well-defined shelving walls (*vide supra*), is surrounded by an inflammatory areola, and rapidly invades the submucous tissues; the tubercular ulcer is surrounded by an anæmic mucous membrane, is more shallow, presents a characteristic worm-eaten appearance, and tends to spread laterally in an irregular or serpiginous manner.

The secretion from tubercular ulceration is usually very profuse, accumulates with great rapidity, and gives to the breath a peculiar sweetish odor that is quite characteristic. Microscopic examination, moreover, will generally detect the presence of Koch's bacillus, which may be looked upon as possessing a certain crucial diagnostic value. In syphilis, on the other hand, the secretion is by no means as great, nor does it accumulate with the rapidity observed in tuberculosis. Syphilitic ulceration, especially if the pharynx be involved, gives to the breath, moreover, a peculiar fetid odor, which may be regarded as diagnostic.

Hæmorrhage from the larynx is not uncommon in tuberculosis, and is rare in syphilis. Syphilitic ulceration tends to heal by peripheral cicatrization; it is doubtful whether extensive tubercular ulceration ever heals. The presence of cicatrices in the larynx is *prima facie* evidence of syphilis, and when these assume their characteristic form there can be little doubt concerning the diagnosis.

Small fibrous outgrowths in the neighborhood of ulcers or cicatrices are additional evidence in favor of syphilis, while papillary hyperplasiæ, occurring in the interarytenoid fold, and especially when they appear in the early stages or precede well-marked changes in the larynx, should awaken suspicion of tuberculosis.[46] While, moreover, small granular or papillary hyperplasias are sometimes found covering the base of tubercular ulceration,* no growth ever arises from that of a syphilitic ulcer or from the resulting cicatrix. Papillary hyperplasiæ are not uncommon in syphilis, but generally mark the seat of past ulceration, as indicated by the presence of a cicatrix or other evidence of pre-existing localized destruction. The papillomatous excrescences of tuberculosis tend in time to ulcerate and break down, those of syphilis rarely, if ever, ulcerate.

Syphilitic ulceration is, as a rule, not painful, nor is the larynx tender to pressure, except when the deeper structures are involved. Deglutition is also accomplished with ease, except in active ulceration of the epiglottis, when the pain is sometimes severe. In tubercular ulceration, on the other hand, especially when the food comes in contact with the ulcerated surface, swallowing is intensely painful and sometimes impossible.

In tuberculosis the respiration is always more or less embarrassed and the voice is enfeebled and veiled from insufficiency of the expiratory forces, while in syphilis, unless the vocal cords be involved, the phonetic quality of the voice is not necessarily impaired. In the differential diagnosis between tuberculosis and syphilis, the so-called *vox rauca* may be accepted as a conclusive sign of the latter.

The presence of cicatrices or active ulceration in the

* The gummata of syphilis may possibly be confounded with tubercular tumors of the larynx, that rare form of tuberculosis first described by the writer of this article in 1882 (N. Y. Archives of Medicine, October, 1882), and of which other cases have been since recorded by Schnitzler (Wiener Med. Presse, Nos. 44 and 46, 1883), and Percy Kidd (Clin. Soc. Trans., London, vol. xvii., p. 154, and St. Bartholomew's Hosp. Rep., vol. xxi.).

pharynx, on the palate, or in the nasal cavities carries with it weighty evidence in favor of syphilis, the condition of these structures in advanced tuberculosis being commonly that of anæmia associated with more or less catarrhal disease.

By attention to the above differential points between the two diseases a mistake can rarely occur. It must, however, be admitted that cases arise in which an appeal to the historical narrative of the case, the physical examination of the lungs and other organs, and even treatment may be necessary before giving a positive opinion. It should be remembered, too, that syphilis and tuberculosis are occasionally combined in the larynx, and that such a condition can only be recognized by the eye of a skilled observer.

The deformities which result from tertiary syphilis may be said to be practically characteristic; but it is well to call attention to the fact that certain essential fevers, *e.g.*, typhoid, small-pox, etc., and diphtheria, occasionally give rise to ulceration of the nasal passages, pharynx and larynx, with perforation of the septum, ozœna, loss of the palate, epiglottis, etc., which present all the gross appearances of syphilis, and which can only be differentiated from the destruction of that disease by the history of the case. This is especially worthy of remembrance, lest, in the after-life of the individual, the previous existence of syphilis be too readily assumed from a perforation of the septum or the loss of the uvula or palate.

Much more difficult is the differentiation of syphilis and cancerous ulceration occurring in the larynx. The chief points to take into consideration here are the following: Cancer is a disease which occurs usually after the fiftieth year of life, which develops less rapidly than syphilis, and most commonly originates from the space between the vocal cord and ventricular bands (except when it descends from the pharynx), as a more or less clearly defined nodular growth, which subsequently ulcerates and is converted into a deep ulcer with bloodshot walls, whose base becomes covered later with fungous, bleeding granulations. Associated with this, or preceding its development, are usually evidences of œsophageal obstruction, with pain on swallowing, pressure, or manipulation with the bougie.

Lancinating pain in the larynx, when at rest, radiating to the ear of the affected side is often present, although it cannot be considered characteristic, as it may occur in any ulcerative disease of the larynx. As the ulcerative process of cancer advances, extensive hæmorrhages not infrequently take place, an uncommon occurrence even in extensive syphilitic ulceration.

The secretion of cancer is profuse, ichorous, and differs materially in odor from the peculiar sickening stench of the discharge produced by syphilitic ulceration. Examination under the microscope will occasionally determine the nature of the case.

Cervical glandular enlargement is uncommon in laryngeal cancer, but is not infrequently associated with tertiary syphilis of the larynx.

While the above may serve as reliable guides to diagnosis, every experienced specialist can recall cases where the latter could only be determined by resort to the sovereign test of treatment. Indeed in any case in which the slightest doubt exists, it is the part of prudence in this, as in other problems of diagnosis, to give the patient the benefit of the doubt.

Prognosis, Complications, Sequels.—The treatment of syphilitic affections of the larynx is generally very satisfactory, unless the cartilages and their envelopes be attacked. Even then a cure may be effected, if the necrotic cartilage be removed. In deep-seated destruction a cure can only be obtained with permanent injury to function.

The complications and dangers to life from tertiary syphilis have been already alluded to in treating of the pathology of the disease. The possibility of the sudden occurrence of œdema, even in the ulcerative laryngitis of the intermediate period, should never be lost sight of, and the danger of the latter increases, in every stage, as the perichondrium is approached.

It is generally possible to produce complete cicatrization of tertiary ulceration, but when the latter is extensive, such an event is only accomplished with considerable deformity or contraction of the larynx. Ulceration occurring in the subglottic region and in the neighborhood of the crico-arytenoid joint is more dangerous to life than when the epiglottis and ventricular bands are attacked. The entire epiglottis may be destroyed without serious impairment of the laryngeal functions and without impediment to deglutition.

In fibroid degeneration, when extensive hypertrophy has taken place, no good has as yet come from constitutional or local treatment, and the patient drifts sooner or later to tracheotomy. Perhaps some good could be accomplished by the use of acids, electric cautery, and other destructive measures, with or without a preliminary tracheotomy in this apparently hopeless class of case.

If properly treated, the prognosis in simple syphilitic catarrh, with or without ulceration, is good, and a permanent cure can often be accomplished. In other cases relapses of the ulcerative process occur from time to time. In both the prognosis is influenced by the previous timely treatment of the constitutional disease. Finally, all syphilitic lesions of the larynx are rendered less amenable to treatment by the predisposition to or coexistence of serious organic disease, as for example, tuberculosis.

Treatment.—The treatment of laryngeal syphilis is both constitutional and local. While there is, perhaps, no disease of the larynx that calls for more careful local methods of cure than syphilis, and in which the prognosis depends so much upon the early laryngoscopic recognition and appropriate topical treatment of its manifestations, the successful accomplishment of the latter is nearly always assisted by and often dependent upon the exhibition of constitutional remedies. Especially is this true of the tertiary lesions of the disease. To neglect general antisyphilitic medication when an ulcer is approaching the perichondrium, or when the destruction of important parts is menaced, is, to say the least, an unsafe and injudicious experiment.

The development and permanency of secondary laryngeal lesions is also influenced, in a great measure, by the early adoption of constitutional measures, for the latter not only assist in the removal of the infiltration, but, in some instances, act as a safeguard against true inflammatory disease.

The different methods of administration of antisyphilitic remedies will be given in the article on Syphilis. The writer can recommend the tonic use of mercury, as formulated by Keyes, in the treatment of syphilitic affections of the larynx. The most direct way of producing both the local and general effects of the drug is by mercurial fumigation or vapor-baths.

The local treatment of the diffuse laryngitis of secondary syphilis does not differ materially from that of simple catarrhal laryngitis (*vide supra*). Should ulceration occur, iodoform may be freely used. In the deeper form of ulceration this drug is of inestimable service, and is in the writer's experience superior to iodine and the nitrate of silver. Sprays of the bichloride of mercury, or the local application of the yellow oxide in cosmoline, vaseline, or like substance are also of considerable value. Before applying these remedies, the ulcerated surface should be thoroughly cleansed by means of a detergent and disinfectant spray, for, otherwise, much of the good effect will be lost.

Papillomatous growths may be dissipated by the local application of alcohol or chromic acid, or, if extensive, may be removed at once with the forceps. Membranous webs may be successfully divided with the galvano-cautery (Elsberg) or by cutting dilators, the best of which is that devised by Whistler, to the excellent results obtainable by which the writer of the present article can testify.

Whether any good can be accomplished by the division of adhesions must be determined by the peculiarities of the individual case. Except when function can be restored, or serious dyspnœa or dysphagia mitigated by the operation, it is better, as a rule, to let them severely alone.

Serious interference with respiration from any compli-

cation calls for tracheotomy, and the early performance of the latter is especially to be advised when the larynx has undergone the fibroid degeneration described above. Systematic dilatation of the larynx, as described under the heading Larynx, Stenosis of, is sometimes of value, but, as a rule, little can be expected of this line of treatment beyond temporary improvement, while it is much inferior to the cutting operation.

Loosened necrotic plates of cartilage, in view of the dangerous complications to which they may give rise, should be removed, if practicable, by endo-laryngeal operation or from without, by exsection.

Syphilis of the Trachea and Bronchi.—The individual portions of the respiratory apparatus possess a decidedly varying disposition to the localization of syphilitic lesions. When the notable frequency with which the nose and larynx are involved during the course of constitutional syphilis is contrasted with the comparative rarity of affections of the trachea and bronchi, it may be with safety said that the lesions of syphilis are more frequently found in the upper than in the lower segments of the respiratory system.

Syphilis of the trachea is of relatively rare occurrence, though not as uncommon as statistics would lead us to believe. Many cases of tracheal syphilis are doubtless overlooked, and especially is this true of those isolated inflammatory and ulcerative conditions which are found in the lower portion and at the bifurcation of the windpipe. In a large proportion of cases, the tracheal affection is secondary to, and consists simply in the extension downward of, infiltration and ulceration of the larynx; it occasionally involves the whole length of the trachea, and even the bronchi in its destructive action.

Much less common is the existence of syphilis of the trachea without associated or pre-existent lesions of the larynx and pharynx, or at least, which is not the result of extension, but which occurs as an independent affection. When the syphilitic disease is thus isolated, it is usually in the lower third of the trachea, from which it extends into the bronchi, or the latter may themselves be the seat of isolated syphilitic lesions.

Isolated syphilis of the upper third is much less commonly met with, and may occur alone or in combination with lesions of the lower trachea and bronchi. Usually both bronchi are affected. When one alone is involved, it is more frequently the right. Only two cases are on record of isolated syphilis of the windpipe in its entire length,[47] while the isolation of the disease in the middle third is so rare that the possibility of its existence in this locality has been denied. This condition has, however, been found and described by the writer[48] of this article, who, at the time of publication, could find but two similar cases in literature (Charnal,[49] Beger[50]), to which a fourth has quite recently been added by Felix Semon.[51]

Pathological Anatomy.—The changes met with in the trachea are identical with those found in the larynx during the secondary and tertiary period, with certain differences of appearance due to peculiarity of anatomical structure.

Mucous patches in the trachea are liable to be overlooked. M. Mackenzie[53] states that he has found them five times. Seidel[54] describes as a mucous patch a pale-red excrescence, the size of a pea, which was associated with condylomata in other parts of the body, and which disappeared without local treatment. Diffuse superficial inflammation, with or without ulceration, fibroid degeneration, gummatous growths, deep ulceration involving the perichondrium and cartilages, leading to peritracheal abscesses, exfoliation of necrotic tissues with subsequent fistulous communication with the exterior, membranous formations and stricture from the cicatrization of ulcers are all observed, either alone or combined in the course of constitutional syphilis.

The ulceration generally descends from the larynx along the inner surface of the tube, presenting a more or less irregular spiral form or peculiarly forked appearance. In other cases, the long diameter of the ulcer is at right angles to that of the trachea, which it surrounds in a circular manner. Usually single, the ulcers vary in size, sometimes extending the whole length of the tube, and even to the first division of the bronchi.

The stenosis which follows the contraction of the cicatricial tissue may affect the tube as a whole, whose lumen it sometimes obliterates almost completely, or the obstruction may be confined to its individual segments. The most common seat of obstruction is the lower third.

The stricture which results from the cicatrization of a tracheal ulcer is of two kinds—excentric and concentric. The former is produced by irregularities or deformities of the tube from the healing of longitudinal or imperfectly annular ulceration, or as the result of perichondritis. In annular or concentric stricture there is often dilatation of the trachea above and below the constriction, forming, so to speak, an hour-glass appearance. The cicatrices do not differ materially from those found in the larynx. They either present a peculiar net-like form or resemble the scars found in the œsophagus from corrosions (Förster). In the writer's case the cicatrix presented a remarkable resemblance to a sheaf of wheat.

Prognosis.—The prognosis of tracheal syphilis is, other things being equal, much less favorable than when the disease attacks the larynx, and it becomes graver as the bifurcation into the bronchi is approached. Extensive ulceration, especially when occurring in the lower third, or when it involves the bronchi, is generally fatal, while in obstruction in the upper third life may be prolonged by resort to tracheotomy or to systematic dilatation. In addition to the usual dangers from stenosis, perichondritis, etc., death has been known to occur from hæmorrhage, due to perforation of the ulcer into the aorta[55] and into the pulmonary artery.[56] In other cases the ulcer has perforated into the mediastinum[57] and into the œsophagus.[58]

Symptoms.—Syphilis of the trachea may run its course without the production of any symptoms during life, or it may give rise to those of the most alarming and dangerous forms of stenosis.

Congenital Syphilis of the Larynx, Trachea, and Bronchi.— Isolated cases of laryngeal lesions in congenital syphilis are to be found scattered here and there through medical periodicals, but systematic writers have either entirely ignored the subject, or referred to a few recorded cases as pathological curiosities. The universal sentiment of authority has, until quite recently, been decidedly adverse to the frequent dangerous implication of the larynx, and the changes in the voice* are referred to the intervention of fortuitous catarrh.

In the *American Journal of the Medical Sciences* for October, 1880, I called attention to the frequency with which the throat is involved in congenital syphilis, and gave a systematic description of the lesions found in the pharyngo-bronchial tract and œsophagus during the course of that disease.[59] In opposition to the then generally received doctrine, I ventured to maintain, as the result of careful investigation of the subject, that, so far from being rare, as was generally supposed, laryngeal affections in congenital syphilis are among the most common and characteristic of its pathological phenomena, and that the invasion of the larynx may be looked for with the same confidence in the congenital as in the ac-

* As early as 1837, Dr. Abraham Colles, of Dublin, called attention to a hoarse cry as a symptom of congenital syphilis and referred to the fact that when the voice became hoarse, the affection of the anus might be shortly expected (Pract. Observ. on the Venereal Disease, etc., Lond., 1837, p. 269.). Rosen, a distinguished Swedish physician is cited by Mahon and Lamauve (Recherch. important sur l'existence, la nature et la communication des mal. syph., etc., p. 371, Paris, 1804), as mentioning a hoarseness occurring without manifest cause, and difficult deglutition as symptomatic of congenital syphilis; but on referring to the English translation of Rosen's work, I find that the sentence relates, not to the inherited syphilis of the child, but to the acquired disease in the nurse (The Dis. of Children and their Remedies, by Nicolas Rosen von Rosenstein, trans. from the Swedish edition of 1771, by Dr. Andrew Sparrman, p. 332, London, 1776). Long before Colles wrote, Josef Jacob Plenck, in speaking of the signs of inherited syphilis, observes that not infrequently the fauces and labial commissures become exulcerated—a condition indicated by a rough voice, nocturnal cries, sleepless nights, etc. "Non raro fauces et commissuræ labiorum simul eroduntur. Index vox rauca, clamores nocturni, noctes insomnes, deglutitio difficilis, tabes, mors" (Doctrina de morbis venereis, p. 149, Viennæ, 1779). This writer also refers to ulceration of the fauces in "latent" syphilis.

quired form of the disease. Further experience and the study of cures since recorded by others have only served to strengthen the positions taken in the paper referred to, for an elaborate discussion of which I must refer to the original, from which also the following account is taken.

The laryngeal lesions of congenital syphilis are constant and characteristic and play an important rôle in the pathological evolution of the disease. Often among the first events of its clinical history, they may rapidly terminate in death, or stealthily advance, inducing progressive morbid changes, which, at first controllable and evanescent, may ultimately become inveterate. And thus the laryngeal inflammation may outlive the series of phenomena which mark the progress of the malady, witnessing their inception, course, and disappearance, itself alone rebellious to the approaches of the treatment by which they have been controlled or dissipated.

The larynx may be involved at any, but usually at an early epoch. Laryngitis may even arise during intrauterine life. The most common period of invasion, however, is within the first six months after birth. Out of 76 cases of laryngitis, 53 occurred within the first year; and of these 43 within the first six months, 17 within the first month, and four within the first week of life. Age, therefore, seems to exercise a predisposing influence upon the eruption of the disease in the larynx. This applies not only to the superficial changes, but also to the more malignant forms of laryngeal destruction.

The laryngeal affection is met with more frequently in the female than in the male sex, in the proportion of three to two. It develops at all periods of the year, without regard to season, although it is naturally aggravated by those atmospheric changes that determine catarrhal conditions.

Imperfect nutrition and forced neglect of hygienic laws sufficiently explain its prevalence among the children of the poor.

The classification of the laryngeal lesions of congenital syphilis into secondary and tertiary will not obtain as in the case of acquired disease. Their pathological evolution is not governed by the same laws that regulate the eruption of syphilis in the adult larynx, nor can we predicate, in any given case, the order in which they will appear. In some, not a few, the deeper destructive forms are the first indication of laryngeal mischief.

In congenital syphilis we may distinguish two principal varieties of laryngeal inflammation. In the one, the changes are limited to the mucous membrane, and, it may be the submucosa; its march is essentially slow, and there is little tendency to invasion of the deeper structures. The other is characterized by deep ulceration of an extremely acute nature, which, especially in early life, rapidly involves the cartilages and their envelopes, and constitutes the most frightful form of the disease. In addition to these, there is a third form, in which a gradual deposit of dense, fibrous material takes place within the tissues of the larynx, and leads to contraction of its lumen.

These pathological facts justify a classification based upon the anatomical seat of inflammation. The laryngeal lesions may, accordingly, be classified as *superficial*, *deep*, and *interstitial*.

Chronic superficial laryngitis is the condition most frequently met with. It is limited to the mucous membrane and submucosa; is essentially chronic; runs a definite course; gives rise to well-defined changes in the larynx, and may be divided into three stages. The first, or stage of hyperæmia, presents nothing diagnostic; the redness is generally diffuse, but sometimes is confined to special areas. It is commonly associated with congestion of the trachea, coryza, and erythema of the fauces and pharynx. Gradually, however, a condition of hypertrophy is developed in the laryngeal membrane, which becomes swollen, thickened, and infiltrated, constituting the second stage or that of infiltration and hypertrophy. If the larynx be examined now, its membrane will be seen to be deeply injected, and often slightly translucent from chronic inflammatory œdema. The epiglottis, ventricular bands, and arytenoids have a swollen, rounded appearance, while the vocal cords are thickened and reddened, and their excursive mobility is impaired. Swelling of the mucous glands sometimes occurs, but the secretion is generally scanty. These changes are occasionally limited to one side of the larynx. Thus, one-half of the epiglottis, its corresponding ary-epiglottic fold and ventricular band may be swollen and thickened, while the opposite side of the larynx is in a state of simple congestion. If the throat be neglected, minute ulcers form by the liquefaction of the superficial portions of the mucous membrane, which partake at first more of the nature of erosions, but which, in long-standing cases, involve the whole thickness of the membrane, and sometimes reach the cartilage. Arrived at this period or stage of ulceration, the affection becomes stubbornly rebellious to treatment. Under antisyphilitic medication the ulcers heal, it is true, and temporary relief is afforded; but sooner or later fresh ones appear in other parts, thickening and hypertrophy become progressive, and secondary changes may be induced in the lungs, either by direct extension through the trachea and bronchi, or as the result of a diminution in the calibre of the larynx itself. As cicatrization of the ulcers takes place, small papillary or polypoid hyperplasiæ arise around the edges of the cicatrix. When small, they impart (post mortem) to the finger a rough granular sensation. They are more common in the child than in the adult, and the same may be said of the ulcerations which precede them.

Such is the common history of this form of laryngitis. Commencing in early childhood as an ordinary catarrh, for which it is often mistaken, it gradually, but surely asserts its specific nature. To it is due the characteristic cry and other symptoms referable to the larynx, so common in the early stages of congenital syphilis. The changes which have been described require time for their completion, months and even years elapsing before they reach their full development.

From the fact that hoarseness and other laryngeal symptoms sometimes coexisted with mucous patches on the palate and in the pharynx, it was assumed by Diday [60] that they were due to the presence of similar lesions within the larynx, in the neighborhood of the ary-epiglottic folds. Czermak [61] and Türck [62] have each reported cases where they were seen with the laryngoscope; and one is referred to in the *Gazette des Hôpitaux*,[63] in which they were found in front of the arytenoids. The patches described by Czermak and Türck are, however, evidently examples of true ulceration, and the account of the laryngeal appearances in the child from the Hôpital Necker is too meagre to be of any value in establishing the existence of mucous patches in the larynx of the congenital syphilitic.

The deep, destructive, ulcerative laryngitis corresponds in physical characters pretty closely to the tertiary inflammation of acquired syphilis. It may follow the superficial form, but generally occurs independently of it. It is sometimes among the first symptoms of infection, and is then most destructive.

As a rule, deep pharyngeal ulceration precedes, or coexists with, this form of laryngitis, but deep ulceration of the larynx occurs, too, without the slightest evidence of pre-existing pharyngeal lesions.

Laryngeal ulceration does not commonly follow the pharyngeal destruction of so-called latent syphilis. The palato-pharyngeal ulceration found in tardy congenital syphilis, has little tendency to invade the larynx; its future theatre of action is the naso-pharynx and nose.

The first stage of this form of laryngitis consists either in a deposit of gummatous material in, or a round-cell infiltration of, the structures which subsequently become the seats of ulceration. The resulting ulcers have the same appearances as those found in the tertiary period of constitutional syphilis, and lead to similar deformity and stenosis. They are single or multiple, symmetrical, or confined to one side of the larynx. Their most frequent seat is the epiglottis; they are often situated in the ventricles; less frequently on the upper and under surface of the vocal cords, ventricular bands, ary-epiglottic folds, and plica meso-arytenoidea. They are also observed in the subglottic cavity.

There is a remarkable tendency in the laryngeal ulceration of congenital syphilis to destruction of the deeper tissues—the cartilages and their envelopes—and this predisposition is most marked in those in whom the throat is attacked at an early stage of the disease. There seems to be an inherent virulence in the process, which finds in the imperfectly developed laryngeal structures an appropriate field for the display of its destructive power. Chondritis, caries, and necrosis are found in over two-thirds of the recorded cases, at all ages. Of these, over three-fifths occurred within the first year of life.

Chronic interstitial laryngitis is intermediate between the two forms of inflammation already described, and is rarer than either; but it is of considerable practical importance, in view of its insidious tendency to stenosis. It consists essentially in a gradual deposit of a fibroid material in the tissues of the larynx, which leads inevitably to serious interference with respiration. But few cases of this condition have been recorded; it is possible, however, that it may be looked for at a period when other interstitial changes, notably keratitis, commonly develop.

Lesions of the Trachea and Bronchi.—The trachea is the seat, though much less frequently, of the three forms of syphilitic inflammation described as occurring in the larynx. Apart from superficial changes, well pronounced tracheitis and deep ulceration are relatively rare. The condition most commonly found is congestion, generally streaked or confined to certain areas, with moderate swelling of the mucous membrane. In two cases examined post mortem there were numerous small ulcers confined to the upper third of the trachea. Small granular hyperplasiæ existed in their vicinity. Ulceration and cicatrices have also been observed by Hüttenbrunner,[64] Woronchin,[65] and Sturges,[66] and a case of stenosis has been recorded by Steiner.[67]

Symptoms of Congenital Laryngeal Syphilis.—Voice and Cry. The cry in the infant and the voice in the older child exhibit all degrees of phonetic impairment, from slight huskiness to the toneless whisper of absolute aphonia. At first the cry has a shrill, piping tone, that has been compared by West and Zeissl to the sound of a child's toy trumpet. This sometimes degenerates into a peculiar squeak. Soon it assumes a characteristic vibratory twang, difficult to describe, but not unlike the vocal resonance which is heard just above the level of a pleuritic effusion. This is probably due to the sonorous vibrations of the thickened mucous membrane, which, at a stage when infiltration has not advanced to consolidation, is loose and admits of being thrown into exaggerated vibration by the current of expired air. Later the voice becomes harsh, cracked, and finally completely lost. It is surprising, however, to what extent the larynx may be involved without impairment of the voice.

Cough is frequently present, and is often a very distressing symptom. It is paroxysmal, suffocative, intermittent, raucous, and often followed by vomiting. The impairment of phonetic quality may be of diagnostic value in those cases in which corresponding changes in the voice are absent. The paroxysms may be excited by crying, or attempted deglutition, but are generally worse at night, leading to attacks of dyspnœa, which threaten suffocation. There is not much expectoration, except in the deep ulcerative form, when it is very profuse and muco-purulent, filling the larynx, and interfering with laryngoscopic examination. The amount of secretion may be taken as an approximate measure of the extent to which the destructive process has advanced.

Respiration is seriously embarrassed, the rhythm hurried, and often interrupted. Attacks of dyspnœa are brought on by coughing and suckling, and are worse at night, leading to orthopnœa, cyanosis, and convulsions. Sometimes the breathing has a *bronchial* sound, and is stridulous and stertorous, according to the amount of obstruction. The respiratory distress is, as a rule, commensurate with the amount of laryngeal stenosis; but secondary changes in the trachea, bronchi, and lungs are sometimes important factors in its production. It is also modified by the degree of nasal obstruction from coryza.

Deglutition is difficult, and sometimes painful and impossible. It is caused by pharyngo-laryngeal swelling and ulceration; but we may assume that, in some cases, it is due to lesions of the œsophagus itself. Laryngismus occurs quite frequently, and is sometimes the immediate cause of death. In a case reported by Thomas Barlow,[68] it was associated with disease of the meninges of the brain.

In many cases no definite relationship seems to exist between the laryngeal and cutaneous lesions of congenital syphilis. It is also an interesting fact that, while the external lesions yield readily to antisyphilitic medication, the laryngeal often have a tendency to persist. The larynx seems to be the last organ to surrender to therapeutic influence. Among the secondary complications in the lungs are congestion, atelectasis, emphysema, bronchitis, pleurisy, and pneumonia. The latter is often the immediate cause of death. But the condition which commands most serious attention is the sudden and fatal laryngeal œdema, which occurs without warning, and from which the patient dies before assistance can be obtained.

Diagnosis.—The laryngeal affection in its first stage may be mistaken for simple laryngitis, and when associated with chronic bronchial irritation or pulmonary inflammation may be confounded with tubercular laryngitis. But the greatest difficulty will arise in its discrimination from laryngeal growths. Here, if laryngoscopic examination be impossible, the diagnosis may be involved in doubt.

Rapid cicatrization of laryngeal ulceration under the iodide of potassium practically settles the question of syphilis; but the diagnosis can be made, in the majority of instances, without invoking this aid. When ulceration attacks the denser structures, the action of the iodide may be slow. Here, if nutrition be stimulated by tonic treatment, and especially by cod-liver oil, the processes of repair will be accelerated. But this obviously does not warrant the conclusion that the destruction is not syphilitic. The power of cod-liver oil over the phenomena of congenital syphilis is the same as that which it exercises in other wasting diseases, an influence which is often overlooked. The assumption, therefore, that an ulcer which heals under this drug, either alone or combined with the iodide of potassium, is necessarily scrofulous, diverts the mind from a rational interpretation of the case.

The *prognosis* will be influenced greatly by the age of the patient; the earlier the throat is attacked, the more serious the results. Pharyngo-laryngeal ulceration occurring within the first year is almost invariably fatal. Deep ulceration of the larynx, in view of its destructive tendency, offers a grave prognosis at any period. The prognosis in chronic superficial laryngitis is more favorable as regards life, though the tendency to laryngeal œdema and spasm should not be lost sight of. This form of laryngeal syphilis is exceedingly persistent and intolerant of treatment. It is often the *primum vivens* and the *ultimum moriens* of the disease. As Vidus Vidius said of syphilis, "it makes many truces, but never peace." In all forms of laryngeal syphilis, death may take place from acute œdema. The prognosis will depend, furthermore, upon the gravity of the general infection and the secondary complications in the lungs.

Treatment.—In acute laryngeal syphilis the treatment should consist in mercurial inunction over the thyroid cartilage, the inhalation of calomel or iodate of zinc in the form of vapor, and the internal administration of potassium iodide. The aggregate daily dose of the latter should be large, and the drug pushed rapidly to the verge of iodism. Should the dangerous symptoms not yield within forty-eight hours, the question of tracheotomy should be considered.

In the more chronic forms, mercury in tonic doses, combined with iodide of potassium, should be exhibited, the local treatment consisting in the use of topical applications and inhalations. As a topical application to the ulcers, great reliance may be placed upon iodoform, or the vapor of the iodate of zinc may be used.

THE EFFECT OF CERTAIN ACUTE MORBID PROCESSES UPON THE THROAT AFFECTIONS OF SYPHILIS, CONGENITAL AND ACQUIRED.—In a paper read before the American Laryngological Association in 1884,[69] I contributed some observations on the manifestations of congenital syphilis in the throat and their behavior under the influence of certain acute diseases, from which the following extract is taken:

In the paper on congenital throat syphilis to which reference has already been made in the preceding article,[70] the following conclusions were reached in regard to deep destructive ulceration of the oro-pharyngeal cavities:

1. That deep ulceration may invade the palate, pharynx, and naso-pharynx at any period of life from the first week up to the age of puberty. Thus, of thirty cases analyzed with reference to the period of invasion, fourteen occurred within the first year, and ten within the first six months of life, the remainder occurring at periods more or less advanced toward puberty. 2. When the eruption of inherited syphilis is apparently delayed until the latter period, that lesions of the palate and pharynx are found with a peculiar constancy, and often first attract attention to the existence of a diathesis of which they are the sole pathological expression. 3. That females are attacked more frequently than males. Thus, out of 69 cases of pharyngeal ulceration, 41 occurred in the former sex. 4. That ulceration may occur in any situation; but its most frequent seat is the palate, for which it exhibits the closest elective affinity. 5. That, when situated at the posterior portion of the hard palate, the tendency is to involve the soft palate and velum, and thence to invade the naso-pharynx and nose; while, situated more anteriorly, it seeks a more direct pathway to the latter, which is established by perforation of the bone. 6. That the next most common seats of ulceration in order of frequency are the fauces, naso-pharynx, posterior pharyngeal wall, nasal fossa and septum, tongue, and gums. 7. That ulceration, especially that of the palate, shows a disposition to centrality of position, together with a special tendency to caries and necrosis of the bone, a fact probably explicable by the great vascularity of the periosteum and medullary membrane in youth. 8. That the tendency to necrosis exists at all periods of life, but especially in early youth, when it is more destructive and less amenable to treatment. 9. That while deep pharyngeal ulceration generally precedes or co-exists with similar affections of the larynx, the latter occurs, too, without evidence of pre-existing pharyngeal lesions. 10. That simultaneous or consecutive ulceration of the palate, pharynx, and nose seems to be characteristic of syphilis, or at least occurs more frequently in this than in any other disease.

I bring these facts again into prominence because they differ from commonly accepted views, and because they possess at least a certain value by reason of the method by which they were obtained. I desire also to reiterate what was said in connection with the confusion of these lesions with so-called "scrofulous" ulceration. Without entering into a discussion of the subject, suffice it to say that there is no just ground for belief in an ulcerative scrofulide of the throat. It needs only the most superficial review of the writings of those who maintain its separate existence to show the utter confusion which prevails, as the result of erroneous views handed down among the traditions of an obsolete pathology.

It is obviously a point of great practical importance that this fact should be recognized, and especially in view of the rapidly destructive tendency of inherited syphilitic ulceration in the oro-pharyngeal cavities and larynx.

The throat ulceration of congenital syphilis not only exhibits a special tendency to rapid invasion of the deeper tissues; it often possesses an inherent virulence which places it apparently beyond the reach of therapeutic control. This is markedly true of the ulceration which occurs in the earlier years of life. Cases are now and then encountered in which the ulcers stubbornly refuse to cicatrize, or do so sluggishly and imperfectly, healing at one point and becoming simultaneously active at others. *Under such circumstances, when remedial measures are apparently of little or no avail, they sometimes cicatrize, as if by magic, on the accession of an acute disease.* It is to this that I wish to direct particular attention.

The clinical study of the cases upon the analysis of which the report referred to was based disclosed certain striking facts in connection with the influence of some of the ordinary infectious diseases of childhood upon the progress of the inherited syphilitic affection. From the historical narrative furnished by this particular group of cases, it would appear (1) *that, while congenital syphilis affords no absolute protection against certain acute infectious diseases, its existence in the individual seems often, other things being equal, to mitigate their severity and exert a favorable influence on their course;* (2) *that certain acute diseases, accompanied by an exanthem, favor the dissipation, at least temporarily, of the throat and other manifestations of the disease;* (3) *that while at no period of the disease is the child exempt from these affections, they are more liable to be contracted during the period of latency—that curious interval of apparent health in congenital syphilis which Cazenave has poetically called the sleep of the virus.*

These remarks are limited to scarlet fever, measles, and chicken-pox, but they could doubtless be extended to embrace others of the exanthemata.

They do not apply, for obvious reasons, in the case of excessive virulence of the syphilitic cachexia or malignant epidemic influence of the intercurrent disease.

Of special interest is the effect produced by acute febrile disease upon the throat lesions of congenital syphilis. *Chronic inflammatory conditions and ulceration of the larynx, pharynx, and nasal passages, are often influenced in a remarkable manner through the presence in the individual of an intercurrent febrile affection. This is, moreover, eminently true of those acute blood diseases with special tendency to local manifestations in the throat, such as scarlet fever, measles, diphtheria, etc. According to personal experience, scarlet fever and measles exert, as a rule, a favorable influence on the course of the throat affection, their supervention being of itself sufficient to cause its complete disappearance. The poisons of the two diseases in their circulation in these regions appear to be mutually destructive, and the throat escapes by virtue of such reciprocal antagonism.* The cure here may be permanent, or relapses of the inflammatory or ulcerative process may follow the removal of the antagonistic influence of the intercurrent disease.*

These remarks do not apply to diphtheria. When this affection supervenes during the existence of lesions in the throat, the patients rapidly succumb to the disease. The existence of syphilis in the child apparently increases the tendency to membranous formation; indeed, in some instances, apart from the presence of the diphtheritic process, there seems to be a *special tendency to fibrinous formation in the nose and retro-nasal space.*

The influence of acute disease upon the manifestations of constitutional syphilis is a subject which has received some attention at the hands of syphilographers, especially certain of the French school; but very little is known as yet beyond the empirical fact that the lesions of that disease, and especially the cutaneous syphilides, are often modified by the introduction into the blood of the virus of an intercurrent febrile affection. This modification may consist either in the permanent or temporary dissipation of existing syphilitic lesions, or in the exaggeration or intensification of the morbid process. Thus, for example, various syphilitic affections, such as skin eruptions, exostoses, etc., have been observed to disappear during the course of erysipelas,[71] acute rheumatism,[72] cholerine,[73] variola,[74] febrile furunculosis,[75] etc. Lasègue[76] has recorded a case of ulceration of the pharynx and tonsils which disappeared during an attack of erysipelas, while in a similar one observed by Martellière[77] a fatal result ensued from that disease. The dissipation of syphilitic eruptions has also occurred during pregnancy,[78] and as the result of vaccination,[79] and there is a case on record where the latter apparently exerted a curative influence in caries of the pharyngeal vault.[80]

* It is quite possible that this may also be true of other mucous surfaces of the body.

The remarkable power of erysipelas over the cutaneous syphilides has suggested its artificial production as a therapeutic agent in these affections,[81] while their behavior under the operation of the vaccine virus led to the now almost forgotten practice of Lukonski.[82] It has, finally, even been proposed by an enthusiastic pupil of M. Hardy to inoculate the poison of small-pox in cases of syphilis which have resisted all other methods of treatment.[83]

It is sufficiently evident, then, that a reciprocal antagonism exists between the poison of syphilis and that of a number of acute diseases. By what pathological law this is brought about is, in the present state of our knowledge of the mutual relations of disease, a matter of pure speculation.

This remarkable influence of the febrile state upon syphilitic inflammation and ulceration of the nasal passages and throat is also, in a measure, true of simple inflammatory conditions of these cavities. It were foreign to the purpose of the present article to elaborate this latter and cognate subject, and I shall, therefore, simply offer for consideration the fact that *simple catarrhal inflammation of these regions occasionally disappears completely, and is permanently cured during the course of an acute febrile disease.* Whether this occur as a phenomenon of so-called "substitution," or as the result of a profound impression made upon the nutrition of the parts by virtue of which abnormal secretion is arrested and the inflamed tract placed in a condition favorable to resolution, can only be determined by the accumulation of more exact scientific data concerning the reciprocal antagonism of pathological processes.

Without, then, attempting any special explanation or generalization, I present the foregoing observations from my clinical experience as a contribution to the study of an interesting but imperfectly understood subject.

John Noland Mackenzie.

[1] For a full statement of this argument, see Lancereaux's treatise on Syphilis. New Syd. Soc. Trans., 1868, vol. i., pp. 8 to 10. Quotations taken from Captain Dabry's book, La Médecine chez les Chinois, Paris, 1863, and from Hessler's translation of the Ayur Véda.

[2] See Lancereaux. [3] Epid. 6, sec. 1. [4] Isag., cap. 20.

[5] De causis acut. morborum, lib. i., cap. viii.

[6] De Chron. Morb., lib. ii., cap. 4; lib. iii., cap. 2.

[7] De Compositionibus Medicamentorum, comp. vii.

[8] See especially Martial, I., 66, 79; VI., 41; IV., 41; XI., 30; VI., 55; XI., 92, 61; VII., 33, etc. [9] Observ. Miscellan., Leid., 1745, def. p. 28.

[10] Die Geschichte der Lustseuche im Alterthume, Halle, 1845.

[11] Orationes ex recensione. Lipsiæ, 1784, vol. ii., orat. 33. See also Rosenbaum, op. cit., p. 158. [12] Lib. I., 78. [13] Lib. IV., 41.

[14] Sulpicius Lupercus Servastus, Junior, in Anthologia veterum latinorum Epigrammatorum et poëtarum, Lib. I., p. 515, *et seq.*, Ed. Burmann, Amstelodami, 1759.

[15] See Nic. Leonicini, De Epidemia, etc., in Aphrodisiac. sive de lue venerea, ab Aloysio Luisino, Lugd. Bat., 1728; Nic. Massa, De morbo gallico, cap. vii., et quarti tract., cap. iv. (Aphr., pp. 46 and 96–97); Jacob. Cataneus, De morb. gall., cap. iv. (Aphr., p. 148); Pet. Maynardi, De morb. gall. tract., i., c. 4, Fernelius, De lue venerea caput (Aphr., pp. 613–614); Victorius, de morb. gall., liber, cap. iii., alludes to flattening of nose and caries of nasal bones, ozœna, polypus (hypertrophic catarrh), etc.; Marchelli, De morb. gall. tract. (Aphr., p. 732); Fallopius, De morb. gall. tract., cap. xxiii. (Aphr., p. 781), and cap. xciii. (p. 824); Botallus, Luis venereæ curandæ ratio, cap. iv.; Tomitanus (B.), De morb. gall., lib. i., cap. xxviii. (p. 1047), also lib. ii., cap. i. (p. 1053); Sylvius, De morb. gall. tract. (p. 1109); Paschal, De morb. gall. tract. (p. 1113); Borgarutius, De morb. gall. methodus. cap. vii. p. 1129), *et al.* See also Benevenius (Antonius), De morb. gall. tractatus, in his work De abditis nonnullis ac mirandis morborum et sanationum causis, Florent., 1507; this work is the first essay on pathological anatomy (Library Surgeon-General's Office, Washington).

[16] Hieronymi Frascatorii, Veronensis, Syphilis, sive Morbi gallici, lib. iii., lib. i. (Aphr., p. 187), B. and lib. ii. (Aphr., pp. 191–192), C. (A.D. 1555); see also Frascator, De Syphilide, seu Morb. gall. lucubratio, cap. i. (Aphr., p. 199).

[17] De morbo gallico, lib. ii., cap. xxii. (Aph., pp. 1222 and 1223), and lib. vii., cap. viii. and cap. xix. [18] Loc. cit.

[19] This case is recorded in the Collegium Anatomicum of Severinus, from which it is taken by Bonetus (Sepulchretum, Ludg., 1700, tom. i., p. 766).

[20] See Astruc., De lue venerea, tom. ii., p. 921: Van Swieten, Comm. in Aphor.; Boerhaave, § 1445; and Lieutaud, Hist. Med., tom. ii., lib. iv., obs. 105, Parisiis, 1777; also Lieutaud, Synopsis of Pract. of Med., ed. Atlee, Phila., 1816, p. 97.

[21] Diss. inaug. de voce, ejusque affectibus, cap. ii., p. 52, Jenæ, 1678.

[22] De pudendorum morbis., sec. 2, 12, p. 182; 9, 10, 13, p. 183, and 14, p. 184, Lugd. Bat., 1722.

[23] Aphorism. de cognos., et. curand. morbis., § 1445, Lugd. Bat., 1728; also Tract. de lue venerea, Lugd. Bat., 1751.

[24] De morb. ven. libri sex, etc., II., cap. ii., cap. vii., IV., cap. iv. and cap. viii. and xi., § xii. Parisiis, 1736, 1738, and 1755. See also Lond. ed. of 1754, pp. 124 to 159 of Bk. ii., and pp. 9–14, 15, 89–90 of Bk. iv.

[25] Joseph Jacob Plenck: Doctrina de morbis venereis, pp. 93, 94, 97, 99, 100, 143, 147, and 149–151. Viennæ, 1779. This writer seems to have been personally familiar with syphilitic affections of the œsophagus and cicatricial stricture of the pharynx.

[26] A Treatise on Gonorrhœa Virulenta and Lues Venerea, vol. ii., pp. 37 and 43. Dublin, 1793.

[27] Treatise on the Ven. Dis., pt. vi., chap. ii., p. 262, *et seq.* (in Works, with notes by Babington, Phila., 1839). See also Babington's excellent observations, pp. 266 to 268.

[28] Complete Treatise on the Symptoms, Effects, etc., of Syphilis, Phila. ed., 1815, p. 293. Swediaur also allludes to affections of the ear (tinnitus) from compression and corrosion of the Eustachian tubes, p. 294.

[29] De sedibus et causis morborum, Epist. xliv., cap. xv., Lond. ed., 1769.

[30] Traité de la phthisie pulmonaire, par M. Raulin, pp. 13 and 79. Paris, 1784.

[31] J. N. Thomann's Annalen der klinischen Anstalt in dem Julius Hospitale zu Würzburg f. das Jahr 1800, p. 242, Würzb., 1803; see also case in Hufeland's Bibliothek der prakt. Heilkunde, Bd. ii., St. ii., S. 143.

[32] Beobachtungen über die Natur u. Heilung der Syphilis. Russische Sammlung f. Naturwissenschaft u. Heilkunst, I. Bd., St. ii., 2ter Abschnitt, S. 36. Riga u. Leipzig, 1816.

[33] The principal of these are the following: Before the era of pathological anatomy, Richard Morton, Phthisiologia, seu exercitationes de Phthisi, Londini, 1689; after the time of Morgagni, Petit (M. A.), Diss. de Phthisi Laryngea, Monspelii, 1790, October 25th (copies of both these rare tracts may be found in the library of the Surgeon-General's Office); Sauvée, Recherches sur la phthisie laryngée, Paris, 1802; Schönbach, De phthisi laryngea, Wilmæ, 1808; Jos. Sigaud, Recherches sur la phthisie laryngée, Strasburg, 1819; Wm. Sachse, Beiträge zur genaueren Kenntniss u. Unterscheidung der Kehlkopfs- u. Luftröhren-Schwindsucht, Hannover, 1821; Barth, Mém. sur les ulcerations des voies aériennes, Arch. gén. de Méd., 1839, p. 137, et folg.

[34] A Practical Treatise on Laryngeal Phthisis, Chronic Laryngitis, and Diseases of the Voice, trans. fr. the French. Philadelphia, 1839.

[35] Allg. Wiener med. Zeitung, No. 48, 1861; No. 43, 1866; also Klinik der Krankheiten des Kehlkopfes, etc. Wien, 1866.

[36] American Jour. of Med. Sc., January, 1876, also Tonic Treatment of Syphilis, New York, 1876.

[37] See Colson, Journal Hebdom., 1831, p. 36; also Crampton (Trans. Dublin Coll. of Phys., vol. iv., p. 91), where two grains of calomel caused ulceration of the throat and death, and Devergie (Archives gén de méd., tom. ix., p. 468), gangrene of the throat and death; also a case (Broadbent, Mem. of Lond. Med. Soc., vol. v., p. 112) where globules of mercury were found upon the laryngeal cartilages after death.

[38] Die Behandlung der Syphilis mit Sublimat-Injectionen, Berlin, 1869; Ziemssen's Encyclop., Am. ed., vol. vii., p. 862, New York, 1876.

[39] Op. cit., p. 377.

[40] Lectures on Syphilis of the Larynx. London, 1879.

[41] Diseases of Throat and Nose, vol. i., p. 356. London, 1880.

[42] Browicz: Centralblatt f. die Med. Wissenschaft, 1877, s. 346.

[43] Syphilitic Membranoid Occlusion of the Rima Glottidis, New York, 1874. [44] Klinik der Krankheiten des Kehlkopfes, 1866, S. 413.

[45] Path. Anat., Bd. iii., p. 22.

[46] Stoerck: Klinik der Krankheiten des Kehlkopfes, etc., Stuttgart, 1880, s. 282. Major: Trans. Am. Laryng. Assoc., 1883, p. 163.

[47] Zurhelle: Berliner klin. Woch., 1872, No. 35. Wilks: Guy's Hosp. Rep., ix., 1863. [48] Wiener med. Jahrbücher, 1881, I. Heft, p. 75, et seq.

[49] L'Union Médicale, 1859, No. 21.

[50] Deutsch. Arch. f. klin. Med., 1879, S. 608.

[51] London Lancet, vol. i., pp. 905–906, 1882.

[52] Reference omitted after electrotype plate had been made.—Editor.

[53] Diseases of the Throat and Nose, vol. i., p. 531. London, 1880.

[54] Seidel: Jenaer Zeitschr. f. Med., 1866, S. 489. Canstatt, 1866, S. 497.

[55] Rokitansky: Patholog. Anatomie, Bd. iii., p. 22. Wilks: Trans. Path. Soc., vol. xvi., p. 52.

[56] Gerhardt: Arch. f. klin. Med., vol. ii., p. 541. Kelly: Trans. Path. Soc., vol. xxiii., p. 45.

[57] Wallmann: Virchow's Archiv, Bd. xiv., p. 201.

[58] Beger, loc. cit., and Axel Key and Oscar Sandhal, cit. in Schmidt's Jahrbuch., 1870, 147, p. 48.

[59] Congenital Syphilis of the Throat; based on the Study of One Hundred and Fifty Cases.

[60] Syphilis des Nouveaux-nés. New Syd. Trans., p. 64–65.

[61] Der Kehlkopfspiegel. New Syd. Trans., 1861, p. 53.

[62] Klinik, etc., Wien, 1867, 161 Fall, and Atlas, xxii., 4.

[63] Gaz. des Hôp., 1860, No. 51, p. 202.

[64] Jahrbuch für Kinderheilkunde, Bd. v., 1872, p. 338.

[65] Ibid., Bd. viii., 1875, p. 108.

[66] Vide Lond. Lancet, April 10, 1880, p. 566.

[67] Jahrb. f. Kinderheilkunde, Bd. vii., 1865, ii., § 64.

[68] Trans. Path. Soc., London, vol. xxviii., 1876–1877, p. 287.

[69] A Contribution to the Study of Congenital Syphilis, Trans. Am. Laryng. Assoc., 1884, and N. Y. Medical Journal, May 31, 1884.

[70] See article on Congenital Syphilis of the Larynx.

[71] Vide Cazenave and Schedel, Practical Synopsis of Cutan. Dis., etc., p. 353, Phila., 1829; Rayer, Traité des mal. de la peau, Paris, 1835; Lamarche, De l'érysipèle salutaire, Thèse de Paris, 1856, and the excellent articles of Mauriac, Étude clinique sur l'influence d'érysipelas dans la syphilis, Paris, 1873; published also in the Gaz. des Hôpitaux, Nouv. sér., 1873, pp. 305, 321, 346, 385, 410, 443, 466, 506, 546, 569, 594, 601. See also Bidenkap's case (cited by Bäumler, von Ziemssen's Cyclopædia, Am. ed., vol. iii., p. 98, 1875).

[72] Rayer, op. cit., p. 546 (Mauriac); see also Jourjon, Infl. des mal. aigués sur quelques manifestations cutan. de la syph., Thèse de Paris, 1870. [73] Cazenave: Traité des syphilides, p. 593 (Mauriac).

[74] Gore: Lancet, September 2, 1858.

[75] Diday (quoted by Mauriac, l. c.).

[76] Traité des angines, pp. 110–112.

[77] Sur l'angine syphilitique (cited by Mauriac).

[78] Gilbert: Bull. de l'acad. de méd., 1851, tom. xvii., p. 156.

[79] Vide Revue méd., 1861, tom. i., p. 157, Jeltzinzki.
[80] Jeltzinzki, l. c. : Sur la cure radicale de la syphilis par la vaccination.
[81] Sabatier: Propositions sur l'érysipèle considéré principalement comme moyen curatif dans les mal. cutanées, etc., Thése de Paris, 1831.
[82] Jeltzinzki, l. c.
[83] Garrigue: De l'influence des mal. aig. sur les diathèses, Thèse de Paris, 1870.

LAS VEGAS HOT SPRINGS. *Location and Post-office,* Las Vegas Hot Springs, San Miguel County, New Mexico Territory.

Access.—By the Hot Springs Branch of the Atchison, Topeka & Santa Fé Railroad from the town of Las Vegas.

Analysis (Professor J. T. Lovewell).—Water collected and temperature taken January 13, 1882.

The quantity of magnesium carbonate in most of these waters is very small, with indications of a small quantity of potassium and traces of lithium. Carbonic acid is probably in the bubbles arising from most of these springs.

No. of Spring.	Temperatures, Fahr.	Parts of Solid Constituents contained in 100,000 Parts of Water.					
		Sodium chloride.	Sodium sulphate.	Sodium carbonate.	Calcium carbonate.	Silicic acid.	Total solid residue.
2	105.5	27.36	16.82	5.02	4.03	9.97	65.53
3	120	27.38	15.72	3.04	2.01	4.41	54.06
4	92	23.41	14.32	2.55	4.02	7.20	58.33
5	140	28.54	16.96	2.10	3.03	8.88	57.90
6	140	27.86	16.86	3.30	2.00	6.03	56.20
6½	140	28.02	17.98	1.24	1.05	6.60	55.63
7	71	28.63	17.86	2.01	3.02	6.03	55.80
8 and 9	114	27.86	10.80	1.54	2.01	?	54.60
10	117	27.70	15.15	3.20	2.05	5.45	56.40
11 with 10 and 12	124	26.04	17.86	1.52	1.18	6.10	54.83
12	112	26.03	15.70	3.14	5.26	6.80	56.46
13	136	28.03	17.72	1.50	3.01	6.16	57.00
14	92	28.85	18.00	1.03	1.24	6.93	55.40
15	82	27.30	18.64	1.00	1.16	?	55.90
16	112.5	27.36	19.86	2.01	1.05	7.26	57.73
17	112.5	27.86	17.22	0.98	1.06	5.33	53.00
18	96	26.63	17.54	1.08	1.00	?	56.16
19*	....	....	....	....	....	....	....
22 with 20	106	26.87	11.54	1.23	1.55	6.20	54.56
21	86	28.19	14.10	1.16	1.10	?	56.95
22	75	27.36	17.32	1.15	1.08	6.63	57.00
23	123	28.19	12.50	2.33	3.01	6.20	60.20
Cold Sulphur †	....	33.01	18.14	11.20	38.52	1.20	102.06

* Spring overflowed at time of collecting water.
† Sulphuretted hydrogen gas.

Therapeutic Properties.—The high temperature and mineral ingredients of these springs, together with the excellent accommodations and healthful location, have rapidly brought them into favorable notice as efficient agents in the treatment—by way of baths—of rheumatism, gout, blood-poisoning, cutaneous diseases, nervous exhaustion and its many attendant ills.

These springs are situated at the entrance of the Gallinas Cañon, among the foot-hills, at an elevation of sixty-seven hundred feet above the sea-level. The atmosphere is very dry.

The springs, forty in number, are divided into two classes as to temperature: Those ranging from 120° F. to 140° F., thirty in number, and those ranging from 75° F. to 100° F., ten in number. The water from the first class, of which No. 6 furnishes 30,000 gallons per day, at a temperature of 140° F., is conducted to the bath-house direct, while the water from the other class is collected in tanks to furnish cold water as required. There are two bath-houses, one for water-baths of all descriptions, and the other for mud-baths. There are two hotels built of stone, the "Las Vegas Hot Springs," replacing the Montezuma, destroyed by fire in 1884, contains three hundred rooms, and the "Hot Springs Hotel," lately refurnished, having a capacity for one hundred guests. Both are excellent hostelries. *G. B. F.*

LATERAL CURVATURE OF THE SPINE. Syn.: Scoliosis; Fr., *Déviation Latérale du Rachis;* Ger., *Seitliche Rückgratsverkrümmung.* A deformity characterized by a lateral deviation of a portion of the spinal column, accompanied by an apparent rotation of the vertebræ, and, when occurring in the dorsal region, by a displacement, of greater or less extent, of the corresponding ribs. There may be one curve or several, but when multiple one curve is usually primary, the others being compensatory and occasioned in part by the unconscious effort of the patient to maintain an erect posture. The most frequent seat of the primary deformity is in the dorsal region, and the convexity of the curve is usually directed toward the right. The lumbar region is affected primarily in a much smaller proportion of cases. In this situation there is no rule as to the direction of the curve, the convexity looking to the right and to the left in about an equal proportion of cases. Kölliker, of Leipzig, found in a study of 721 cases of true lateral curvature (*Centralblatt f. Chirurgie,* No. 21, 1886), 466 single curves, of which 391 were in the dorsal region; and of these 208 were with convexity to the right, and 183 to the left. Of 222 double curvatures, 172 were of convexity to the right in the dorsal region and to the left in the lumbar.

Writers usually recognize three degrees or stages of scoliosis, which classification may be retained as affording a convenient ground upon which to base the prognosis. In the first stage the spine becomes straight upon the patient assuming the prone position; in the second, the curve does not disappear when the subject lies down, but may be nearly or entirely overcome upon suspension of the patient, combined with properly directed pressure by the hands of the surgeon; in the third degree but little or no correction of the deformity is obtainable by these manœuvres.

Lateral curvature is pre-eminently a disease of early adolescence, though it may be met with at any age from early infancy to middle adult life. It is developed most commonly between the ages of eight and fifteen—at least it is at that time that it usually comes under the eye of the surgeon, though, as the affection is so insidious in its growth and may exist for so long a time before giving rise to any notable deformity of the shoulder—the sign that is usually the first to attract the attention of the mother—the date of its commencement may be put somewhat earlier. Ketch, of New York, has collected the statistics of 229 cases treated at the New York Orthopædic Dispensary (New York *Medical Record,* April 24, 1886). The cases selected were only those where the typical symptom of rotation was present. They were divided into three classes: 1, those in which the deformity was first observed from birth to the twelfth year, or the age of childhood; 2, those in which the deformity was first observed from the twelfth to the eighteenth year, or the age of puberty; 3, those where the deformity was first observed from the eighteenth year and upward, or the age of complete development. During the first period there were 120 cases (52.4 per cent.); during the second, 94 cases (41 per cent.); during the third, 9 cases (3.9 per cent.). In 6 cases the age was not stated. Of 1,000 cases collected by Eulenburg 78 were first noticed between birth and the sixth year, 216 between the sixth and seventh year, 564 between the seventh and tenth, 107 between the tenth and fourteenth, and 35 over the fourteenth. Of 500 cases of rachitic curvature 454 occurred during the first three years of life.

Girls are affected more frequently than boys in the proportion of between four and five to one. Ketch found the proportion 189 females to 40 males, and Kölliker 577 females to 144 males. The latter noticed the curious fact that in the more severe forms of the curvature the number of males approached that of females, and in the worst cases, triple curvature of the third degree, there were even more males than females affected. Although in ordinary acquired scoliosis the direction of the primary curve, when in the dorsal region, is to the right in a very large percentage of all the cases, the contrary obtains, in the writer's experience, in infantile curvatures where the convexity points almost invariably to the left.

The predisposing cause of lateral curvature lies, in a large proportion of cases, in a weakness of the muscles and ligaments concerned in maintaining the spinal column